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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,304	10/30/2003	Kenneth Goodson	COOL-01800	1389
28960	7590	12/21/2004		
HAVERSTOCK & OWENS LLP 162 NORTH WOLFE ROAD SUNNYVALE, CA 94086			EXAMINER MCKINNON, TERRELL L	
			ART UNIT 3743	PAPER NUMBER

DATE MAILED: 12/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,304

Applicant(s)

GOODSON ET AL.

Examiner

Terrell L Mckinnon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-13, 15-16, 21-24, 28, 30-31, 33-36, 38-43, 45-53, 56-61, 64-69, 74-77, 79-86, 88-93, 96-101, 106-109, 114-117 and 119-123 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 14, 17-20, 25-27, 29, 32, 37, 44, 54, 55, 62, 63, 70-73, 78, 87, 94, 95, 102-105, 110-113 and 118 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

Receipt is acknowledged of applicant's amendment filed October 13, 2004.

Claims 1-123 are pending and an action on the merits is as follows.

Applicant's arguments with respect to claims 1-123 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 5-7, 11-13, 15, 16, 28, 30, 31, 33-36, 38, 40-43, 45, 46, 49-53, 57-61, 64, 65, 74-77, 81-86, 88, 89, 92, 93, 97-101, 114-117, 119 and 121-123 are rejected under 35 U.S.C. 102(b) as being anticipated by Chu et al. (U.S. 5,269,372).

Chu discloses and intersecting flow network for a cooling system comprising all of the applicant's claimed and disclosed limitations of the instant invention (see abstract; column 1, lines 8-12, column 1, lines 47-60, column 2, lines 30-35).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 4, 21-24, 39, 47, 48, 66-69, 79, 80, 90, 91, 106-109 and 120 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. (U.S. 5,269,372) in view of Chu et al. (U.S. 6,253,835).

Chu's ('372) invention discloses all of the claimed limitations from above except for the fluid being a two phase flow fluid; at least a portion of the fluid undergoes a transition between single and two phase flow conditions in the heat exchanger; microchannel having an area dimension within the range of 10 micron² and 100 micron²; microchannel having a height dimension within the range of 50 microns and 2 millimeters; microchannels being separate from each other by a spacing dimension of within the range of 10 to 150 microns; microchannels having a width dimension within the range of 10 to 150 microns; a flow impeding element for controlling flow resistance; and at least one heat transferring feature has an appropriate surface area to control the fluidic resistance to the fluid.

5. However, Chu ('835) teaches fluid being a two phase flow fluid; at least a portion of the fluid undergoes a transition between single and two phase flow conditions in the interface layer (column 4, lines 56-63); a flow impeding element (48) for controlling flow resistance; at least one heat transferring feature has an appropriate surface area to control the fluidic resistance to the fluid (Fig. 4); and the use of microchannels having a cross-section that has varies over a length thereof (column 2, lines 19-45 and column 5, lines 1-13).

Given the teachings of Chu, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cooling system of Chu ('372) with fluid being a two phase flow fluid; at least a portion of the fluid undergoes a transition between single and two phase flow conditions in the heat exchanger; a microchannel having an area dimension within the range of 10 micron² and 100 micron²; a microchannel having a height dimension within the range of 50 microns and 2 millimeters; the microchannels being separate from each other by a spacing dimension of within the range of 10 to 150 microns; microchannels having a width dimension within the range of 10 to 150 microns; a flow impeding element for controlling flow resistance; and at least one heat transferring feature has an appropriate surface area to control the fluidic resistance to the fluid.

Doing so would improve heat transfer and the cooling performance of the microchannels.

6. Claims 10, 56 and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. (U.S. 5,269,372) in view of Chu et al. (U.S. 6,253,835) as applied to claims above, and further in view of Newton et al. (U.S. 6,437,981).

Chu's invention discloses all of the claimed limitations from above except for the use of a sensor along the fluid flow path.

7. However, Newton teaches the use of a sensor along a microchannel fluid flow path (90).

Given the teachings of Newton, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the cooling system of

Chu ('372) with use of a sensor along the fluid flow path.

Doing so would provide a means of detecting the fluid flow temperature with the microchannels.

Allowable Subject Matter

8. Claims 8, 9, 14, 17-20, 25-27, 29, 32, 37, 44, 54, 55, 62, 63, 70-73, 78, 87, 94, 95, 102-105, 110-113 and 118 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1-7, 10-13, 15-16, 21-24, 28, 30-31, 33-36, 38-43, 45-53, 56-61, 64-69, 74-77, 79-86, 88-93, 96-101, 106-109, 114-117 and 119-123 have been considered but are moot in view of the new grounds of rejection

Applicant states " Gruber does not teach channeling fluid to minimize temperature differences along a heat source. Further, Gruber does not teach controllably channeling selectable amounts of a cooling fluid to one or more specific regions on a heat source."

Applicant's arguments have been fully considered but they are found not persuasive in view of the newly discovered references to Chu et al (U.S. 5,269,372) and Chu et al. (U.S. 6,253,835) as stated above.

Chu ('372) discloses channeling fluid to minimize temperature differences along a heat source; and controllably channeling selectable amounts of a fluid to one or more

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predetermined locations on a heat exchanging surface (see abstract; column 1, lines 8-12, column 1, lines 47-60, column 2, lines 30-35).

Conclusion


Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L Mckinnon whose telephone number is 571-272-4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 571-272-4791. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L McKinnon
Primary Examiner
Art Unit 3743
December 13, 2004